

CLAIMS:

1. A method for encoding an input bitstream of an input signal comprising the steps of :
receiving the input bitstream;
extracting non-essential information from the input bitstream to generate a
5 reduced bitstream;
re-encoding the non-essential information to generate re-encoded data in accordance with a different encoding rule than used for the non-essential information in the bitstream; and
including the re-encoded data in a user data element associated with the
10 reduced bitstream.
2. A method as claimed in claim 1 wherein the user data element is a user data section of the reduced bit-stream.
- 15 3. A method as claimed in claim 1 wherein the user data element is comprised in a separate bit-stream.
4. A method as claimed in claim 1 wherein the step of extracting non-essential information comprises removing non-essential data corresponding to the non-essential
20 information from the input bitstream.
5. A method as claimed in claim 1 wherein the step of extracting non-essential information comprises modifying quantisation levels of the reduced bitstream.
- 25 6. A method as claimed in claim 1 wherein the step of re-encoding comprises a compression of the non-essential information.
7. A method as claimed in claim 1 wherein the non-essential information corresponds to less significant data values associated with the input signal.

8. A method as claimed in claim 1 further comprising the step of determining the non-essential information in response to a perceptual model associated with the input signal.
- 5 9. A method as claimed in claim 1 further comprising the step of including an indication in the user data element of the presence of re-encoded data in the user data element.
- 10 10. A method as claimed in claim 1 further comprising the step of including additional data in the user data element.
11. A method as claimed in claim 10 wherein the additional data comprises a watermark.
- 15 12. A method as claimed in claim 10 further comprising the step of encrypting at least part of the additional data.
13. A method as claimed in claim 10 wherein the additional data comprises data selected from the group consisting of:
- 20 a. revocation data;
- b. digital rights management information data; and
- c. checksum data.
14. A method as claimed in claim 1 wherein the step of re-encoding the non-essential information comprises encryption.
- 25 15. A method as claimed in claim 1 wherein the input bitstream is an MPEG encoded bitstream of the input signal.
- 30 16. A method as claimed in claim 15 wherein the non-essential information corresponds to higher frequency transform coefficients.
17. A method as claimed in claim 15 wherein the step of extracting comprises extracting run-level pairs of the bitstream.

18. A method as claimed in claim 17 wherein at least some of the run-level pairs are the run-level pairs immediately prior to an end of block indication.
- 5 19. A method as claimed in claim 17 wherein the step of re-encoding the non-essential pairs comprises re-encoding the run-level pairs using a different run length value to data word association than specified for MPEG.
20. A method as claimed in claim 1 wherein the reduced bitstream and the input
10 bitstream are both in accordance with the same encoding standard.
21. A method as claimed in claim 1 wherein a combined data rate of the re-encoded data and the reduced bitstream is equal or less than a data rate of the input bitstream.
- 15 22. A computer program enabling the carrying out of a method according to claim 1.
23. A record carrier comprising a computer program as claimed in claim 22.
- 20 24. A method for decoding an input bitstream for an input signal comprising the steps of :
receiving the input bitstream, the input bitstream comprising a reduced
bitstream for the input signal;
receiving a user data element comprising encoded data associated with the
25 input signal;
extracting the encoded data from the user data element;
re-encoding the encoded data to generate enhancement data compatible with
an encoding of the input signal in the reduced bitstream; and
generating an output bitstream by combining the reduced bitstream and the
30 enhancement data.
25. A method as claimed in claim 24 wherein the encoded data of the user section is encoded in a format which is incompatible with an encoding format of the reduced bitstream.

26. A method as claimed in claim 24 wherein the encoded data is encrypted and the step of re-encoding comprises decrypting the encoded data.
- 5 27. A method as claimed in claim 24 wherein the input bitstream comprises an MPEG encoding of the input signal.
28. A method as claimed in claim 24 further comprising the step of extracting additional data from the user data element.
- 10 29. A method as claimed in claim 24 wherein the additional data is a watermark.
30. A method as claimed in claim 24 wherein the user data element is a user data section of the input bitstream.
- 15 31. A computer program enabling the carrying out of a method according to claim 24.
32. A record carrier comprising a computer program as claimed in claim 28.
- 20 33. An apparatus (101) for encoding an input bitstream of an input signal, the apparatus (101) comprising:
means (109) for receiving the input bitstream;
means (111) for extracting non-essential information from the bitstream to
25 generate a reduced bitstream;
means (113) for re-encoding the non-essential information to generate re-encoded data in accordance with a different encoding rule than used for the non-essential information in the bitstream; and
means (115) for including the re-encoded data in a user data element
30 associated with the reduced bitstream.
34. A apparatus (107) for decoding an input bitstream for an input signal, the apparatus (107) comprising:

means (117) for receiving the input bitstream, the input bitstream comprising a reduced bitstream associated with the input signal;

means (117) for receiving a user data element comprising encoded data for the input signal;

5 means (119) for extracting the encoded data from the user data element;

means (121) for re-encoding the encoded data to generate enhancement data compatible with an encoding of the input signal in the reduced bitstream; and

means (123) for generating an output bitstream by combining the reduced bitstream and the enhancement data.

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35. A bitstream comprising a reduced bitstream section corresponding to an encoding of a content signal and a user data section comprising encoded data for the input signal encoded in a different format than an encoding format of the reduced bitstream section.